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| APPLICATION NUMBER | FILING DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO. |
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08/940,686 09/30/97 RITZDÖRF

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EXAMINER

IM62/0623
ROCKEY, MILNAMOW & KATZ, LTD.
TWO PRUDENTIAL PLAZA-SUITE 4700
180 NORTH STETSON AVENUE
CHICAGO IL 60601

ART UNREADER, PAPER NUMBER

1741

DATE MAILED:

06/23/99

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-18 is/are pending in the application.
Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-18 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948. (drawings not objected to)
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of Reference Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4 (5/21/98)
- ☐ Interview Summary, PTO-413
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--SEE OFFICE ACTION ON THE FOLLOWING PAGES--

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The disclosure is objected to because of the following informalities:

Page 34, line 3: "contracts" should be --contacts--.

Page 42, line 13: "develop" should be --develops--.

Page 44, line 9: "85" should be --854--.

Page 46, line 15: "7-7" should be -- 21-21 --.

Appropriate correction is required.

Claims 1- 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The last paragraph of claim 1 recites that the contact face is pre-conditioned by plating a layer made from a metal-containing material which is similar to material which is to be plated onto the semiconductor workpiece. Initially, the expression "similar" is a relative term which is not defined by the claim and the specification does not provide a standard for ascertaining the requisite degree. One of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is not apparent how "similar" the material plated onto the contact face would have to be to the material plated onto the semiconductor workpiece to fall within the scope of the claim.

Additionally, it is not possible to determine what the actual structure of the

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recited semiconductor workpiece holder is. By reciting that the composition of the material plated onto the contact face is related to the material which is to be plated onto the semiconductor, the structure is based on a process step which occurs at some time in the future. This limitation is indefinite.

Independent claims 5 and 9 recite similar limitations.

Lines 9 and 10 of claim 5 recite a "contact face layer". However, a "contact face" has not been recited and this expression lacks antecedent basis.

Independent claim 13, line 6 recites "a contact face plating material". The scope of this limitation is indefinite because it is not clear what materials are included. How is it determined whether a material is suitable for being electroplated onto the contact face?

Claim 13, line 10 recites electroplating a "workpiece plating material" while the preamble of the claim recites a method for plating "metals". The scope of these terms appears to differ. So that the positively recited step of electroplating agrees with the method set forth in the preamble, --a metal-- should be inserted in line 10 after "electroplating".

Claim 14 and 15 are duplicates. One of these claims should be amended or canceled.

Claim 16, line 10 similarly recites electroplating a "workpiece plating material". The preamble of claim 15 recites a method for plating "copper". These

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terms are of different scope. So that the claim is consistent, "workpiece plating material" in line 10 should be changed to --copper--.

Claims 17 and 18 are duplicates. One of these claims should be amended or canceled. If claim 16 is amended, claims 17 and 18 should be amended so that the language is consistent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yee et al (5,078,852) in view of the Lowenheim text *Electroplating* and Roedel (1,308,508).

Yee discloses apparatus for use in electroplating metal onto a silicon wafer. Electrical contact is made with the wafer through cam assemblies 16 each of which includes an electrode finger. Cams 28 which include the electrode fingers may be made of a metal such as titanium.

Applicant's invention differs from the teaching of Yee et al by reciting a plating layer on the electrode finger in the region where it contacts the substrate.

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Lowenheim discloses that it is known to electroplate metal onto a workpiece to impart specific properties such as wear resistance and conductivity (page 169).

Lowenheim further discloses that electroplated gold layers are applied to electrical devices because of its good electrical contact properties, corrosion resistance, and because it will not "poison" semiconductor materials (page 269).

Roedel discloses a plating hook which has a covering of non-corrosive metal such as lead.

The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have electroplated a layer of metal onto the cams of Yee et al because desirable properties such as improved electrical contact, better corrosion resistance and avoidance of poisoning the semiconductor workpiece would have been obtained as taught by Lowenheim and Roedel.

Claims 9-12 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yee et al (5,078,852) in view of the Lowenheim text *Electroplating* and Roedel (1,308,508) as applied to claims 1-8 and 13-15 above, and further in view of Poris (5,723,028) and Mayer et al (4,118,301).

Claims 9-12 and 16-18 additionally recite that the plating layer applied on the electrode finger is copper and that copper is electroplated onto the semiconductor workpiece. Poris discloses that it is known to electroplate copper

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onto a semiconductor wafer (column 4, lines 1-11). Mayer et al discloses the use of a copper sleeve on a spring workpiece holder in the region where the holder contacts the workpiece (figure 6 and column 7, lines 65-68).

It would have been obvious to have utilized copper as an electrode finger plating layer because it is known that copper provides a good contact surface with a workpiece being plated as shown by Mayer et al and to have deposited copper onto the semiconductor because Poris suggests the use of copper as a material for forming semiconductor metallization. One of ordinary skill would recognize that the use of the same metal on the contact region of the electrode finger that is electroplated onto the semiconductor workpiece would avoid the poisoning problem mentioned by Lowenheim since any metal transferred from the electrode finger to the semiconductor would be the same as that intentionally deposited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William Leader, whose telephone number is (703) 308-2530. The examiner can normally be reached Mondays-Thursdays from 8:00 AM to 5:00 PM eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kathryn Gorgos can be reached at (703) 308-3328. The fax phone number for *official* after final faxes is (703) 305-3599. The fax phone number for all other *official* faxes is (703) 305-7718. Unofficial communications to the Examiner should be faxed to (703) 305-7719.

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Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0661.

WL

William Leader:wtl
June 21, 1999


Kathryn Gorgos

Supervisory Patent Examiner
Technology Center 1700